Space Weather Forecast

Issued on Wednesday, 14 June 2023 at 13:19 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of Solar Activity rising to Moderate with R1/R2 Radio Blackouts.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Low with only common class flares observed, the largest, likely from a new region just over the northeast limb. There are five numbered sunspot regions on the disc, with the four in the western hemisphere small and largely stable or declining. A new region rapidly grew in the southeast in last 24 hours, with ongoing development occurring. This has a relatively simple magnetic field configuration but consists of a sequence of small spots with the potential for further growth and complexification. Further spots are also rotating onto the eastern disc, including the likely source of the peak flare, however these are currently too close to the limb to ascertain a detailed analysis at present. No Earth-directed CMEs (coronal mass ejections) were observed.

Solar Wind / Geomagnetic Activity: The solar wind eased after recent fast wind enhancements. The solar wind speed declined from slightly elevated values toward background levels of around 350km/s. The total magnetic field strength was weak with the north-south component, also weak and variable between positive (north) and negative (south) directions. Geomagnetic activity was mostly Quiet, with an Unsettled interval observed at 14/0000-0300UTC.

Energetic Particles / Solar Radiation: The count rate of energetic particles (High energy protons) remained at background with no solar radiation storms occurring.

Four-Day Space Weather Forecast Summary

Solar Activity: Low activity is most likely to continue, however there is a chance of this increasing to Moderate with isolated Moderate flares possible (R1/R2 Radio Blackouts). These most likely from regions rotating onto the Earth-facing disc, or the newly developing region in the southeast.

Solar Wind / Geomagnetic Activity: There are no Earth-directed CMEs. Solar winds are forecast to be at background to slightly elevated until the next coronal hole sourced fast wind enhancement, expected later on day 2 and into day 3 (15 and 16 Jun). Solar winds of around 500 km/s are forecast. Mostly Quiet geomagnetic activity at first, rising to Unsettled with Active spells with the fast wind enhancement. There is a chance of G1/Minor Storm intervals, mainly early on day 3 (16 Jun). Activity easing to Quiet with Unsettled intervals by day 4 (17 Jun).

Energetic Particles / Solar Radiation: The count rate of energetic particles (High energy protons) is forecast to persist at background with no solar radiation storms occurring.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	15	20	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	40	40	40	40
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	1	1	1	1
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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